

ABSTRACT OF THE DISCLOSURE

A location data structure represents a location in a number of different ways, and may include a map view scale appropriate for rendering the map. A map view data structure contains sufficient information to derive a number of independent descriptions of a map view. A route data structure may be used at any point in the route calculation and rendering process, and includes a locations field that includes the two-end points of the route, a calculated route data field representing a calculated route between the two end-points, an options field that specifies the options used or to be used to calculate the route, a driving directions field that represents driving directions for the route, and an identity data field that specifies whether the route data structure is a request to calculate a route, a response to a route calculation request, or a rendering request.

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